

SCIENTIFIC NOTE

***Uroleucon formosanum* (Takahashi) (Homoptera: Aphididae)
Found on *Youngia japonica* (L.) DC on Guam and Rota
in the Mariana Islands****R.H. Miller¹, O. Idechiil¹, R.G. Foottit² and K.S. Pike³**

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Abstract. *Uroleucon formosanum* (Homoptera: Aphididae) was collected from Asiatic (Oriental) hawksbeard, *Youngia japonica*, on Guam and Rota in 2003. These collections constitute a significant range expansion for *U. formosanum* into the western Pacific region. The aphid and its host plant were likely accidentally introduced to the islands in cargo or by travelers returning from known host regions in eastern Asia and Japan.

Key words: Guam, Rota, Mariana Islands, Aphididae, *Uroleucon formosanum*, *Youngia japonica*, Micronesia

Uroleucon formosanum (Takahashi) (Homoptera: Aphididae) was collected from Asiatic (Oriental) hawksbeard, *Youngia japonica* (L.) DC, on Guam on 21 February 2003 and from the neighboring island of Rota on 27 February 2003. The collection site on Guam was located near the University of Guam Marine Biology Laboratory in Mangilao (13.426554 N, 144.80000 E) in a shaded area north of the main laboratory and administration building at an elevation of about 3m. On Rota *U. formosanum* was collected from *Y. japonica* growing at the base of boulders in a WWII memorial park (14.14646 N, 145.18508 E) on the elevated Sabana Plateau in the south of the island at an elevation of approximately 400 m.

The collections described in this report constitute a significant range expansion for *U. formosanum*, which has previously been described from South Korea (Lee et al. 2002b), the Republic of China, Japan, , the People's Republic of China, Vietnam, India, and Russian Siberia (Lee et al. 2002a), but not from the Philippine Archipelago or from other islands in Micronesia. *U. formosanum* was not collected in recent surveys of aphids on Guam (Pike et al. 2000), Palau, the Northern Marianas Islands, or Yap (R.H. Miller, CALS-AES, University of Guam, unpublished data), nor in earlier insect surveys of Micronesia including Fullaway (1912), Swezey (1942), Beller (1948), Oakley (1953) and Essig (1956). However, Takahashi (1921) describes *U. formosanum* as one of the most common aphids in Japan and Taiwan, with sexual forms occurring in Japan in November and female alates present in Taiwan year round.

The aphids collected on Guam and Rota consisted of apterous viviparous females of various age classes resembling those described by Takahashi (1921). No winged forms were collected from either island. The aphid was easily distinguished from other aphids occurring on these islands by its exclusive occurrence on *Y. japonica*, its relatively large size, long pale legs with darker distal portion of the femora and tibial apices, and red body

with the metathorax and first two abdominal segments black (Takahashi 1921). No other aphids on Guam or Rota are as distinctly red, although *Hysteroneura setariae* (Thomas) on grasses, *Pentalonia nigronervosa* Coquerel on ginger and banana, and *Toxoptera citricida* (Kirkaldy) on citrus may exhibit a dark purple tint under certain lighting conditions. No other aphids have been reported on *Y. japonica* on Guam or Rota (Pike et al. 2000), and we do not consider *U. formosanum* to constitute a threat as a crop pest in the Mariana Islands.

U. formosanum is the only aphid yet found on Guam or Rota that colonizes *Y. japonica*, and was found on both islands in colonies feeding along the stem immediately beneath the flower heads. *Aster scaber* Thunb., *Cirsium japonicum* DC, *Ixeris dentata* Nakai, *Ixeris sonchifolia* Nakai, *Lactuca brevirostris* Champ. Ex Benth., *L. debilis* Benth. & Hook.f., *L. formsana* Maxim., *L. gracilis* DC, *L. hastata* DC, *L. indica* L., *L. raddeana* Maxim., *L. scariola* L., *L. triangulata* Maxim., *Taraxacum platycarpum* Dahlst., *Sonchus asper* (L.) Hill, *S. oleraceus* L. and *Youngia sonchifolia* Maxim. have also been reported as hosts on the Asian mainland and in Japan (Takahashi 1921, Lee et al. 2002a, Lee et al. 2002b). *S. oleraceus* is the only plant among these that is present on Guam, and has also been reported from the western Pacific islands of Wake, Kwajalein, Majuro and Arno (L. Raulerson, Division of Natural Sciences, College of Arts and Sciences, University of Guam, personal communication). *U. formosanum* has not been observed infesting *S. oleraceus* on Guam.

Y. japonica is an annual herb in the family Compositae, with a slender, erect growing habit that prefers moderately shaded, moist habitats. Its obovate, lobed, and dentate leaves grow from a rosette at the base of the plant, with occasional alternate leaves above (Moore and Krizman 1981). Its height when mature is about 12 cm. Its numerous yellow flowers grow on multiple heads on a slender panicle and measure 1–1.5 cm in diameter. Propagation is by seeds, which are topped with soft white hairs and dispersed by the wind (Haselwood et al. 1983) or carried by animals or people when they stick to fur or clothing.

Y. japonica is generally considered a weedy species in East Asia and Japan where it grows in lawns, along roadsides, and in other disturbed areas where soil fertility is marginal for other plants (Ohwi et al. 1984). *Y. japonica* was first described from Guam in 1962 (Stone 1970). The means of its arrival to Guam and Rota is unknown. Because *Y. japonica* has medicinal uses in some Asian cultures where it is used as an antitussive, a febrifuge and as a treatment for boils and snakebites (Duke and Ayensu 1985), it may have been imported intentionally. More likely is that it was accidentally introduced to Guam and perhaps Rota from the Asian mainland or Japan by one of the many tourists visiting the Marianas Islands, by US military personnel or by returning residents.

The *Y. japonica* population on Rota may have established from seeds blown from Guam. Guam receives considerably more international visitors and cargo than does Rota, which lies about 80 km northeast of Guam and is separated from Guam by a section of open ocean known as the Rota Strait. While prevailing winds in the region normally blow from the northeast or east, during the rainy season that extends from July through December strong winds may originate from the south or southwest (Lander 1994). In an analogous situation, aphidiid wasps introduced to Guam have likely been carried over the Rota Strait to Rota (Miller et al. 2002). Tropical cyclones, powerful storms with winds often in excess of 240 km/hr, also occur frequently over or near the two islands. These storms may completely uproot trees and plants as they pass over land, and could transfer seeds or plant parts from one island to another.

Voucher specimens are maintained in the Guam Insect Collection, CALS-AES, University of Guam, Mangilao, Guam 96923 by R.H. Miller; at IAREC, Washington State University, 24106 N. Bunn Rd., Prosser, WA 99350-8694 by K.S. Pike; and at the Canadian National Collection, Eastern Cereal and Oilseed Research Centre, Agriculture and Agri-Food Canada, Central Experimental Farm, KW Neatby Bldg., 960 Carling Ave., Ottawa, Ontario

K1A 0C6, Canada by R.G. Foottit. R.G. Foottit identified aphid specimens. O. Idechiil provided identification and distribution information for *Y. japonica*.

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